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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,421	01/22/2004	Paul Ashton	CDSI-P01-040	4529

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SASAN, ARADHANA	

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1615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,421	ASHTON ET AL.	
	Examiner	Art Unit	
	Aradhana Sasan	1615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-18,20 and 21* is/are pending in the application.

4a) Of the above claim(s) *4-9 and 11-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 10, 14, 16-18 and 20-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

1. The remarks and amendments filed on 09/28/2007 are acknowledged.

2. Claims 15 and 19 were cancelled. Claims 4-9 and 11-13 were withdrawn because they are drawn to the non-elected invention. Claims 1, 2, 14 and 18 were amended.

3. Claims 1-3, 10, 14, 16-18 and 20-21 are included in the prosecution.

Response to Arguments

Rejection of claim 14 under 35 USC § 112

4. In light of applicant's amendment of claim 14 to replace "adrenergic agent" with "carbonic anhydrase inhibitor", the rejection under 35 USC § 112, second paragraph is withdrawn.

Rejection of claims 1-3, 10, 14-17 under 35 USC § 103(a)

5. Applicant's arguments, see Page 7, filed 09/28/2007, with respect to the rejection of claims 1-3, 10, 14-17 under 35 USC § 103(a) as being unpatentable over Smith et al. (US 5,378,475) in view of Wong et al. (US 6,331,313) have been fully considered but are not persuasive.

Applicant argues that Smith does not disclose or suggest an inner core containing a matrix material that is admixed with the active agent in addition to the first impermeable polymer coating and that Smith defines the inner core as containing "an agent effective in obtaining a desired effect" (Col. 4, lines 20-21). Applicant argues that Wong does not teach a device that includes a matrix material that is admixed with the

drug to inhibit or prevent decomposition, as recited in the pending claims. Applicant submits that Smith in view of Wong does not teach or suggest all of the claimed limitations.

Although Smith does not expressly teach the limitation of including polymers in the core along with the active ingredient, under the disclosure of the core, the supporting reference, Wong, teaches that the drug "may also be present as a solution or be dispersed in a polymer matrix. The polymers used in the matrix with the drug are bio-compatible with body tissues and body fluids and can be biodegradable or substantially insoluble in the body fluids" (Col. 10, lines 35-39). Biodegradable polymers that can be used with the drug in the core are disclosed (Col. 9, line 60 to Col. 10, line 9). Therefore, the limitation of the carbonic anhydrase inhibitor (CAI) admixed in the matrix material of amended claim 1 would have been obvious to one of ordinary skill in the art at the time the invention was made. The limitation of inhibiting or preventing decomposition of the CAI would have been obvious because Wong teaches that the polymers are substantially insoluble in bodily fluids. When the CAI is mixed with a substantially insoluble polymer and the mixture is present in the core, one skilled in art would expect to inhibit or prevent the decomposition of the CAI with a reasonable expectation of success.

Therefore, the rejection of 5/30/07 is maintained.

Rejection of claims 18-21 under 35 USC § 103(a)

6. Applicant's arguments, see Page 7, filed 09/28/2007, with respect to the rejection of claims 18-21 under 35 USC § 103(a) as being unpatentable over Chen et al. (US

5,902,598) in view of Wong et al. (US 6,331,313) have been fully considered but are not persuasive.

Applicant argues that Chen does not teach a device that includes a matrix material that is admixed with the effective agent to inhibit or prevent decomposition and that Chen is silent with regard to any substance in the inner core other than the effective agent. Applicant argues that Wong does not teach a device that includes a matrix material that is admixed with the drug to inhibit or prevent decomposition, as recited in the pending claims. Applicant submits that Chen in view of Wong does not teach or suggest all of the claimed limitations.

Although Chen does not expressly teach a device that includes a matrix material that is admixed with the effective agent, under the disclosure of the core, Wong teaches that the drug "may also be present as a solution or be dispersed in a polymer matrix. The polymers used in the matrix with the drug are bio-compatible with body tissues and body fluids and can be biodegradable or substantially insoluble in the body fluids" (Col. 10, lines 35-39). Biodegradable polymers that can be used with the drug in the core are disclosed (Col. 9, line 60 to Col. 10, line 9). Therefore, the limitation of the carbonic anhydrase inhibitor (CAI) admixed in the matrix material of amended claim 1 would have been obvious to one of ordinary skill in the art at the time the invention was made. The limitation of inhibiting or preventing decomposition of the CAI would have been obvious because Wong teaches that the polymers are substantially insoluble in bodily fluids. One skilled in the art would mix the CAI with the polymers disclosed by Wong in order to prevent the decomposition of the CAI with a reasonable expectation of success.

Applicant asserts that the passage regarding the materials disclosed by Chen is referring to materials that can comprise the first coating layer that will cover the inner core and does not make obvious the inclusion of a matrix material admixed with the active agent as taught in the present application. This is found persuasive and this aspect of the rejection is withdrawn.

Therefore, the rejection of 5/30/07 is maintained.

MAINTAINED REJECTIONS:

The following is a list of maintained rejections:

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-3, 10, 14, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 5,378,475) in view of Wong et al. (US 6,331,313).

The claimed invention is a sustained release drug delivery device for insertion or implantation in or adjacent to the eye of a patient comprising an inner drug core comprising a carbonic anhydrase inhibitor and one or more coating layers which allow the sustained release of the carbonic anhydrase inhibitor.

Smith teaches a sustained release drug delivery device including an inner core or reservoir with the active ingredient and coating layers (Abstract). The first coating layer is "essentially impermeable to the passage of the effective agent, and a second coating

permeable to the passage of the effective agent" (Col. 1, lines 6-12). The invention includes "an ocular device suitable for direct implantation into the vitreous of the eye" which provides "sustained controlled release of various compositions to treat the eye without risk of detrimental side effects" (Col. 3, lines 38-43). Further, Smith teaches that "the devices are particularly suitable for treating ocular conditions such as glaucoma" (Col. 5, lines 28-29). The active ingredients in the inner core of the device include carbonic anhydrase inhibitors (Col. 5, line 58).

Smith does not expressly teach the carbonic anhydrase inhibitors acetazolamide, methazolamide, dichlorphenamide etc.

Wong teaches a controlled release biocompatible ocular drug delivery device that can be implanted in the eye (Abstract). The device comprises "a substantially impermeable polymeric outer layer covering a core which comprises the drug to be delivered ..." (Col. 1, lines 56-59). The device "is implanted in the eye to treat or prevent a variety of conditions of the eye such as ... ocular pressure..." (Col. 8, lines 12-15). Wong further teaches "carbonic anhydrase inhibitors such as acetazolamide, methazolamide, dichlorphenamide, ..." as drugs that can be delivered in the device (Col. 10, lines 55-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the sustained release drug delivery device for an ocular implant, as suggested by Smith, and combine it with the implantable ocular drug delivery device including carbonic anhydrase inhibitors and produce the instant invention.

One of ordinary skill in the art would have been motivated to do this because Smith teaches using the device for treating glaucoma and Wong teaches using the device for treating high ocular pressure and includes specific carbonic anhydrase inhibitors. One of ordinary skill in the art would use the carbonic anhydrase inhibitors in the device to treat high ocular pressure that is associated with glaucoma. As mentioned earlier, the device allows sustained controlled release of the active "without risk of detrimental side effects" (Col. 3, lines 40-43).

Regarding instant claims 1-2, 14 the limitations of a sustained release drug delivery device for implantation in the eye, an inner core comprising a carbonic anhydrase inhibitor, a first coating that is substantially impermeable to the passage of the carbonic anhydrase inhibitor, one or more additional coatings that are permeable to the passage of the carbonic anhydrase inhibitor would have been obvious to one skilled in the art over the sustained release drug delivery device for an ocular implant teaching of Smith in view of the carbonic anhydrase inhibitors taught by Wong. Smith teaches a first coating layer that is "essentially impermeable to the passage of the agent" and a second coating layer that is "permeable to the passage of the agent" (Col. 3, lines 15-29). The first coating layer being impermeable to the passage of the agent, controls "the release of the agent out of the drug delivery device" (Col. 7, lines 10-15). The limitation of the carbonic anhydrase inhibitor admixed in the matrix material would have been obvious over the teaching by Wong that the drug "may also be present as a solution or be dispersed in a polymer matrix. The polymers used in the matrix with the drug are bio-compatible with body tissues and body fluids and can be biodegradable or substantially

insoluble in the body fluids" (Col. 10, lines 35-39). Biodegradable polymers that can be used with the drug in the core are disclosed (Col. 9, line 60 to Col. 10, line 9). When the CAI is mixed with a substantially insoluble polymer and the mixture is present in the core, one skilled in art would expect to inhibit or prevent the decomposition of the CAI with a reasonable expectation of success.

The limitations of the impermeable coating having sufficient dimensional stability of instant claims 2 and 3 would have been obvious to one skilled in the art given the teaching in Smith that "devices formed of polymeric materials that are insoluble in tear fluid retain their shape and integrity during the course of the needed therapy ..." (Col. 2, lines 18-21). "Materials that may be suitable for fabricating the fist or second coating layer of the device include naturally occurring or synthetic materials that are biologically compatible with body fluids and eye tissues, and essentially insoluble in body fluids with which the material will come in contact" (Col. 6, lines 30-35). Therefore, a person skilled in the art would find that an ocular implant device comprised of coating materials that are insoluble in eye fluids would retain its shape and integrity during the course of therapy.

The limitation of carbonic anhydrase inhibitors of instant claim 10 would have been obvious to one skilled in the art given the carbonic anhydrase inhibitors taught by Wong (Col. 10, lines 55-61).

The limitation of the inner drug core admixed with a polymer matrix of instant claims 15 and 16 would have been obvious to one skilled in the art given the teaching by Wong that the drug "may also be present as a solution or be dispersed in a polymer

matrix. Wong also teaches examples of biodegradable polymers that can be used in the device where "the outer layer degrades after the drug has been released for the desired duration" (Col. 9, lines 43-45 and lines 60-67, Col. 10, lines 1-9). The limitation of inhibiting or preventing decomposition of the CAI would have been obvious because Wong teaches that the polymers are substantially insoluble in bodily fluids. When the CAI is mixed with a substantially insoluble polymer and the mixture is present in the core, one skilled in art would expect to inhibit or prevent the decomposition of the CAI with a reasonable expectation of success.

The limitation of co-extruding the inner drug core and the coating layer of instant claim 17 would have been obvious to one skilled in the pharmaceutical art of process and product development. In order to have the drug core coated by the polymer matrix, co-extrusion is an obvious method used in the art.

9. Claims 18, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US 5,902,598) in view of Wong et al. (US 6,331,313).

Chen teaches sustained release drug delivery devices "suitable for treating ailments affecting the eye" (Col. 2, lines 5-6). Chen discloses an "ocular device suitable for direct implantation into the vitreous of the eye" which provides "sustained controlled release of various compositions to treat the eye without risk of detrimental side effects" (Col. 4, lines 6-11). The "device includes an inner core or reservoir which contains an agent effective in obtaining a desired effect. The device further includes a first coating layer, a second coating layer and a third coating layer. The first coating layer ... is

permeable to the passage of the effective agent ..." (Col. 4, lines 53-58). The device is "particularly suitable for treating ocular conditions such as glaucoma ..." (Col. 5, lines 65-66).

Chen does not expressly teach carbonic anhydrase inhibitors as the active agents.

The teaching of Wong (with respect to carbonic anhydrase inhibitors and ocular implants) is stated above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the sustained release drug delivery device for an ocular implant, as suggested by Chen, and combine it with the implantable ocular drug delivery device including carbonic anhydrase inhibitors and produce the instant invention.

One of ordinary skill in the art would have been motivated to do this because Chen teaches using the device for treating glaucoma and Wong teaches using the device for treating high ocular pressure and includes carbonic anhydrase inhibitors as drugs. One of ordinary skill in the art would use the carbonic anhydrase inhibitors in the device to treat high ocular pressure that is associated with glaucoma. Chen teaches a device that allows sustained controlled release of the active "without risk of detrimental side effects" (Col. 4, lines 6-11).

The limitation of the inner drug core admixed with a polymer matrix of instant claims 19 and 20 would have been obvious to one skilled in the art given the teaching by Wong that the drug "may also be present as a solution or be dispersed in a polymer

matrix. Wong also teaches examples of biodegradable polymers that can be used in the device where "the outer layer degrades after the drug has been released for the desired duration" (Col. 9, lines 43-45 and lines 60-67, Col. 10, lines 1-9). The limitation of inhibiting or preventing decomposition of the CAI would have been obvious because Wong teaches that the polymers are substantially insoluble in bodily fluids. When the CAI is mixed with a substantially insoluble polymer and the mixture is present in the core, one skilled in art would expect to inhibit or prevent the decomposition of the CAI with a reasonable expectation of success.

The limitation of co-extruding the inner drug core and the coating layer of instant claim 21 would have been obvious to one skilled in the pharmaceutical art of process and product development. In order to have the drug core coated by the polymer matrix, co-extrusion is an obvious method used in the art.

Conclusion

10. No claims are allowed.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aradhana Sasan whose telephone number is (571) 272-9022. The examiner can normally be reached Monday to Thursday from 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached at 571-272-8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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